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ABSTRACT

Horizontal instruction techniques used to improve reading skills were tested with 63 limited-English-speaking, Spanish-dominant high school students. The students were divided into four groups. Two experimental groups received instruction in how to infer the main idea of a paragraph through sequential lessons in classification skills. Two control groups were taught how to infer the main idea, but without the use of classification techniques. One experimental and one control group were taught in English and the others were taught bilingually. Contrary to expectation and previous research, results on word classification and paragraph analysis tasks showed no statistically significant evidence to support use of the classification techniques. However, some evidence was found for a treatment effect for abstract paragraph tasks, although it was not statistically significant. The two bilingual groups showed significant pre- to post-test gains, unlike the monolingually taught groups. A variety of methodological limitations could have produced these results. Further research is recommended. (MSE)

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A PRELIMINARY REPORT ON AN INVESTIGATION USING A PIAGETIAN MODEL TO TEACH READING TO SPANISH-SPEAKING SECONDARY STUDENTS

BY

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A paper prepared for presentation at the 15th Annual International Bilingual/Bicultural Education Conference (NABE), April 1986

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A PRELIMINARY REPORT ON AN INVESTIGATION USING A PIAGETIAN MODEL TO TEACH READING TO SPANISH-SPEAKING SECONDARY STUDENTS

ABSTRACT

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Marguerite M. McInnes, Ph.D.

Government data indicate that Hispanics aged 14 to 19 are twice as likely as other groups of students not to have completed high school. Many of these students are Spanish-language dominant and are far below the national average in all areas of academic achievement, including reading. Very little research, however, has been conducted in the field of teaching reading to Spanish-speaking students on the secondary level.

Recently, research has been conducted with English-speaking secondary students, teaching them the strategies necessary to infer the main idea of paragraphs. These studies have shown that experiences based on the concept of horizontal instruction helped them to improve their reading skills. Horizontal instruction utilizes classification skills matched with the student's level of cognitive development as part of the instructional model.

The study investigated this theory with sixty-three limited English-speaking, Spanish-language dominant high school students. Two groups received instruction in how to infer the main idea by means of sequentionally developed classification lessons. One group was taught bilingually. Two additional groups received instruction in how to infer the main idea, but not by means of classification lessons. One of these groups was also taught bilingually.

Although the differences were not statistically significant between the groups on their scores on the implied main idea tasks, the gains favored the two experimental groups. The language of instruction effect was statistically significant. The results of the study merit future research.

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I. INTRODUCTION

Identification of Research Problem

Hispanic high school students have been consistantly below the national average in all areas of academic achievement. High school achievement based on the use of testing instruments indicates that the scores of Hispanic high school students during the period 1971-1975 were at a statistically significantly lower level than those of white non-Hispanic students of the same age. (Duran, p. 36). In a recent survey of 6,698 Hispanic high school students, (Nielsen and Fernandez 1981, cited Duran, p. 39), the average achievement scores in mathematics, reading, and vocabulary shows that all Hispanic subgroups performed uniformly lower than white non-Hispanics. Research based on data from the U.S. Census and the U.S. Department of Education indicates that Hispanics, aged 14 - 19, are twice as likely not to have completed high school as white non-Hispanics. The percentage of non-completions increases steadily with age, jumping sharply between the ages of 16 and 18. These data have not changed substantially during the 10-year period, 1968-1978. (Rosen and Ortego, 1969; Brown, Rosen and Hill, 1980).

An investigation into the causes for poor achievement and non-completion rates for Hispanic students are inconclusive. Some factors related to the students' lack of achievement and possible non-completion of school include the influence of language background, home environment, self-image, and low academic expectation and social esteem exhibited by teachers for Hispanic children. (Duran, p.55-57)

Since many of these students encounter problems learning to

read in English, it is reasonable to assume that this limitation may contribute to their high non-completion rate of high school. Although older bilingual students now comprise the fastest growing group of non-English-speaking students in the United States, very little research has been addressed to the literacy needs and problems of these students. (McGroarty, p. 5). The author continues that while the needs of secondary level bilingual students are quite different from those of elementary bilingual students, federal education programs have focused primarily on the elementary level. McGroarty suggests the need for further research on the secondary level into areas such as effective teaching strategies and the relationship between language skills and achievement. A review of the literature dealing with reading in a second language reveals very little recent research concerning the teaching of English comprehension skills to Spanish-speaking high school students.

In a review of current research, Mace-Matluck (1982) notes that much of the research available on reading in a bilingual setting has been conducted with either college level populations in the United States, or with younger populations in other countries. (p. 2). Research that deals with reading comprehension skills concerns many ethnic groups, but does not seem to focus on Hispanic secondary students, nor does it deal with teaching a specific comprehension skill. Much of the research in second language reading deals with topics such as pyscolinguistics, the transfer of readings skills from one language to another, the use of cloze, sociolinguistics and passage dependency.

By the time students enter high school, whatever their linguistic orientation, they are faced with many cognitive tasks, that vary from class to class. In a Piagetian developmental model, students who enter high school are ususally in transition between concrete and formal operations. (Lowery 1981b). Generally, they perform certain operations such as seriation and classification with concrete objects. However, they have not yet developed all of these abilities at the symbolic or abstract level.

Reading and writing skills, which are critical for success in school, are symbolic and abstract experiences. The symbols represent concrete or abstract ideas, which the reader must process within his own experiential framework. Barrett (1968) and Gerhard (1975) write that one cognitive skill necessary in developing higher level reading skills is classification. In order for students to read at the inferential level, they must be able to classify at the abstract or symbolic level. Yet, research conducted with English-speaking secondary students indicates that formal operations may not be reached until college age or later. For example, of the seniors continuing to graduate from high school, Renner and Stafford (1976) found 60% to be still concrete operational. Although Piaget suggests that intervention may not be desirable, Rawson (1979) notes that it may be necessary because the cognitive transition which Piaget describes does not appear to be taking place as students progress from elementary through secondary school.

In an attempt to examine the relationship between classification skills and reading comprehension, research has been

conducted with English-speaking secondary school students teaching them the strategies necessary to identify the inferred main idea of paragrahs, (Hadsell 1978; Stein 1979; Berget and Valverde 1983). These studies have shown that experiences based on the concept of horizontal instruction have helped English-speaking students improve their reading comprehension skills. The concept of horizontal instruction derives from Lowery's (1977, 1981a) interpretation of Piaget's theories concerning cognitive development and classification skills. With this model, the student is challenged to use a particular mental operation with many different materials at various levels of abstraction, without the requirement of functioning at an increasingly higher level of development. This model was applied to the concept of using class-inclusion tasks in order to teach the main idea of paragrphs. Lowery suggests that students learn something most readily when they are provided with concrete, pictorial and finally abstract or symbolic experiences during the learning process. Several researchers have contributed to the validation of this model in the sciences (Askha 1973; Loggins 1972; Lowery and Allen 1969, 1970, 1978;) and in mathematics (Collis 1971; Flavell 1963; Langbort 1981), cited Lowery, p. 48).

Other research in reading and classification appears to indicate a relationship between comprehension and the ability to categorize. Research by Smith-Burke (1976) indicates a significant relationship between class-inclusion skills and comprehension of the main idea. Williams (1984) found that a basic categorization model does underlie text processing, that is the

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comprehension of simple expository text.

Definition of Research Problem

It is the opinion of the investigator that since horizontal instruction has been successful with English-speaking secondary students, it may prove to be successful with Spanish-speaking students. It was the purpose of this research, therefore, to investigate the implementation of classfication lessons, based on the concepts of class-inclusion and horizontal instruction, to teach this particular group of readers the inferred main idea of paragraphs in English. Because of the apparent lack of research dealing with teaching reading comprehension to Spanish-speaking secondary students, the proposed study should be of value in understanding some of the processes involved when these students are learning to read in English. The results also may suggest some possible remedies for the difficulties they encounter.

This paper is a preliminary report on the results of an investigation into the following research questions:

QUESTION #1.

DO LIMITED ENGLISH-SPEAKING, SPANISH-LANGUAGE DOMINANT HIGH SCHOOL STUDENTS WHO RECEIVE CLASSIFICATION LESSONS, PERFORM BETTER ON A CRITERION TEST ON HOW TO INFER THE MAIN IDEA THAN SIMILAR STUDENTS WHO RECEIVE TRADITIONAL INSTRUCTION? ARE THEY BETTER ABLE TO CLASSIFY:

A. WORDS

QUESTION #2.

DO LIMITED ENGLISH-SPEAKING, SPANISH-LANGUAGE DOMINANT HIGH SCHOOL STUDENTS WHO RECEIVE BILINGUAL INSTRUCTION PERFORM BETTER ON A CRITERION TEST ON HOW TO INFER THE MAIN IDEA THAN STUDENTS WHO RECEIVE MONOLINGUAL INSTRUCTION? ARE THEY BETTER ABLE TO CLASSIFY:

A. WORDS

II. RELATED RESEARCH

Due to the limited amount of research dealing with teaching English reading comprehension skills to Spanish-speaking secondary students, the literature review has been divided into two parts: the first part deals with research using horizontal instruction to teach inferential reading skills; the second part deals with the current research concerning learning and process theories, as well as some teaching strategies used in second language reading.

PART 1. Horizontal Instruction and Reading

Sequentially developed classification lessons, based on the concept of horizontal instruction, were recently used to teach reading and writing skills to 97 ninth and tenth grade students in a San Francisco Bay Area high school. (Berget and Valverde, 1983). The students all scored below the 50th percentile on the Reading Subtest of the Comprehensive Test of Basic Skills. The control group students were selected from another high school that was matched with the target school on all possible variables, including SES, reading achievement scores, and the type of curriculum used in the regular language arts program. The number of control students was a random sample of 96 ninth and tenth grade students.

The students received instruction in the following skills in reading: 1. single paragraph, Main idea: stated, inferred; 2. multiple paragraphs, main idea: stated, inferred; 3. comparison/contrast - single paragraph, main idea: stated, inferred; 4. Cause/effect - single paragraph, main idea: stated, inferred, 5. cause/effect - multriple paragraphs, main idea:

stated, inferred. The students also received a parallel program in writing skills.

The project incorporated a standard pre-posttest comparison group design. Pretesting was conducted on all measures during September and October, 1982. The posttests were administered during April and May , 1983. The evaluation measures included the Comprehension Subtest of the Comprehensive Test of Basic Skills, as well as criterion referenced measures developed by the project staff with the assistance of the project evaluator and the developmental learning consultant. Statistically significant results were obtained in both reading and writing on the standarized and criterion referenced measures for the experimental groups at the ninth and tenth grade levels. The researchers concluded that the sequentially developed classification lessons had a positive effect on the reading comprehension levels of the students who participated in the study.

This type of instruction has also had positive results in other related studies. Hadsell (1979) taught inferential comprehension to low SES eighth grade students and obtained signilificant results. Camozzi (1980) and Osborn (1981) both replicated Hadsell's study with similar types of eight grade students and obtained significant results. Stein (1979) taught inferential main idea comprehension to fourth grade students and also found significant results. McInnes (1980) also found significant results teaching the inferred main idea to limited English-speaking, Spanish-speaking high school students. Tingly (1980) successfully applied horizontal instruction in the teaching of infe-

rential comparison/contrast comprehension skills to ninth and tenth grade students. Reichart (1979) taught prefixes and their meanings with statistically significant results to seventh and eighth grade students, while Hassen (1981) found significant results using horizontal instruction to teach context clues to eighth and ninth grade students. In the majority of these studies, the populations were randomly selected. All of the studies had experimental as well as control groups.

Although reading comprehension is considered to be a complex process by researchers and educators, there appears to be little agreement among them as to its definition. There also appears to be little agreement about the methods best suited to teach the main idea. Researchers, however, seem to agree that it is a question that merits further investigation. The horizontal instructional model is one that appears to have been successfully implemented in teaching inferential reading skills. The horizontal model utilized the students' classification skills, which appear to be applicable to the teaching and learning of inferential reading.

Part 2. Reading in a Second Language

Reading, notes Clarke (1980), is perhaps the most throughly studied and least understood process in education today. The quantity and variety of theoretical models of reading in the first language (L1) have resulted in a great amount of theoretical and pedagogical diversity among second language (L2) researchers and teachers. Recently, a number of authors have cited the lack of a generally accepted theory of L2 reading as a major obstacle to the teaching and testing of ESL reading skills.

(Clarke p. 203).

One of the most powerful learning theories that has affected reading research for both native and second language readers is that of psycholinguistics. Goodman (1970) has described reading as "a psycholinguistic process by which the reader, a language user, reconstructs as best as he can a message which has been encoded by a writer on a graphic display." (p. 135). Goodman views this act of reconstruction as being a cyclical process of sampling, predicting, testing and confirming. The value of this theory, assert Clarke and Silberstein (1977), lies in the insights it provides into the reading process. Research by Kolers (1969) indicates that reading is only incidentally visual and that more information is contributed by the reader than the print on a page. The reader is able to take a graphic representation and assign it to a group of concepts already stored in memory. Research by Menosky (1971) and Goodman and Burke, (1973) cited Clarke, p.51), indicates that reading errors change as the reader progresses into a pasaage, supporting the position that the reader builds on a previous store of knowledge and adds information from the text which he is reading. Eskey (1979) asserts that the contribution of the learner in the process of learning to read is generally underestimated. Researchers including Goodman (1970), Smith (1971), Saville-Troike (1979) and Ibrahim (1979) agree that efficient reading does not result from the identification of all the elements on the page, but rather from selecting the most productive language clues necessary to determine the message of the writer.

When applying psycholinguistic theory to the process of reading in a second language, Coady (1979), suggests that the reader needs successful interaction among three factors: higher level conceptual abilities, background knowledge, and process strategies. It is obvious, however, that the ESL student is going to be deficient, to some degree, in the process strategies which involve knowledge of the target language. Coady notes, however, that many students have a great deal of proficiency in English, yet read very slowly with poor comprehension. This may indicate a reading problem and not a language problem. Research by Oller (1972), Tullius (1971) and MacNamara (1970, cited Coady p. 10) seems to support this theory. Their research indicates that the number of fixations and regressions do not differ between native language readers and ESL readers. But the duration of fixations is longer for ESL readers. Comprehension loss, therefore, seems to be attributable to the poor use of process strategies, rather than purely lingusitic difficulties.

The fluent reader appears to rely primarily on syntactic and semantic information to rapidly predict meaning. Kolus (1970, cited Coady p. 10) found that proficient bilingual speakers of French and English read and perceive in terms of meaning rather than graphic display. Bean, Levein and Graham (1981) also theorized that fluent readers typically process the graphemic features of print at a low level of awareness, in order to concentrate on the task of comprehension. As predicted, beginning ESL students significantly exceeded the other students in the study on graphemic identification tasks. The authors write that the results of this study suggest that beginning ESL students may be

getting an instructional message about the reading process that over emphasizes the least useful aspects of print at the expense of comprehension.

Goodman (1971) hypothesizes that the reading process, in which proficient readers make generally successful predictions, will be much the same for all languages. Clarke (1979, 1980), however, argues that a language ceiling in L2 may prohibit the complete transfer of L1 reading skills to L2 reading. Clarke (p. 139) hypothesizes that a "short circuit" in the good reader's strategies, caused by a limited control of the target language, can lead to poor reading. Clarke conducted two studies to determine: 1) if psycholinguistic theory could explain the reading behaviors of adult Spanish-speakers reading in Spanish and in English, and 2) if these readers transferred their skills to English. The results of these studies, suggest Clarke (p. 206), confirm the psycholinguistic perspective of reading for proficient Spanish-speakers reading in Spanish and in English. However, it appears that language competence exerts a powerful effect on the L2 reader, thereby reducing the good reader's advantage over the poor reader when their performances in English are compared.

In a related study, Cziko (1978), suggests that syntactic, semantic and discourse constraints serve as important sources of information for the fluent L1 reader. Difficulties in L2 reading may be due to an inability to make full use of these constraints because of low language proficiency. In his study analyzing the reading behaviors of advanced, intermediate and low level

French students, Cziko found that advanced students' reading behavior paralleled native speaker reading behaviors. Those of the intermediate and low level L2 readers did not. The advanced students used an interactive strategy of using both graphic and contextual information. The less competent students appeared to rely primarily on graphic information, indicating that reading strategies are related to the reader's level of linguistic competence. (p. 114).

Although the results from Cziko and Clarke would indicate that basic language competence is involved in comprehension, Hudson (1982) argues that some nonlanguage skills also are being utilized. He argues that in the studies by Clarke and Cziko good L1 readers maintained an advantage over poor L1 readers at their proficiency level when both were reading in a second language. It could be that reading skills per se, affect the degree to which the proficiency ceiling restricts comprehension, just as the proficiency ceiling may restrict the degree to which good reading skills are applied. Hudson, therefore, investigated the question of whether nonlinguistic factors could cause a breakdown in the processing of L2 readers. The purpose of his study was to examine the role played by schemata in adult ESL students who were proficient readers in their native language. The results indicate the induced schemata in his study apparently allowed access to language decoding which was otherwise not available. Hudson suggests that the significance of this finding is that the linguistic ceiling is only one determinant of reading comprhension. The process of learning to read in L2 may partially a matter of first experiencing skills and strategies as usable, and

then abstracting the principles necessary for successful reading. (p.20).

Diaz (1981) found that second language learning and cognitive development appeared to affect Puerto Rican adolescents' reading achievment. When the students' cognitive development was arrested during intensive second language learning, which occurred at a lower cognitive level, many of these adolescents suffered from a loss of self-esteem. This affected not only reading achievement, but led to cultural conflicts. Diaz concludes that the poor use of process strategies and a lack of conceptual abilities also affected the students' reading achievement.

Many researchers have addressed the question of the best methods or teaching strategies that should be used with ESL readers. Vorhaus (1984) suggests stressing only the vocabulary, grammar and word order of the target language that is different from the students' own understanding of reading material in any language. In other research conducted with university students, Laufer-Dvorkin (1981) investigated three methods of teaching reading comprehension. The best progress was made by the group which received only an "intensive" method which stressed the use of short texts, thorough work on language and reading problems. Keen (1983) also studied three different approaches with ESL university students: intensive phonics, language experience, and an eclectic approach which included a sample lesson from a basal series, which included a reading passage, followed by reinforcement exercises. The students preferred the last approach, which Keen suggests is the most successful with advanced ESL readers

because it provides a variety of both language and reading skills.

Ibrahim (1979) contends that failure to recognize the organizational patterns of a paragraph entails by necessity failure to grasp its total meaning. The author suggests teaching ESL readers written patterns of English and how to read them as one way of dealing with the problems the ESL reader may encounter. Clarke's (1977) model for successful ESL reading includes having the student take risks, guessing, as well as giving students practice in using the minimum number of syntactic clues in order to obtain the maximum amount of information from the text.

What seems apparent from the literature dealing with reading in a second language, is that no one learning theory or teaching strategy appears to hold the answers to the problems students encounter in second language reading. Current research indicates that language competence affects comprehension, but it is not clear to what extent. Other factors such as processing strategies or nonlanguage abilities may also play an important role in effective second language reading.

CHAPTER III. METHOD

The study compared the horizontal instructional model with a traditional method of teaching Spanish-speaking high school students how to infer the main idea. The horizontal instructional model consisted of using classification lessons based on part-whole relationshps to teach students how to infer the main idea of paragraphs. The paragraphs reflected part-whole relationships. The study investigated the effectiveness of classification lessons per se as well as their effectiveness in teaching students how to infer the main idea. This method was compared with traditional lessons in how to infer the main idea that were representative of those usually included in published materials. In these materials, the students were taught several strategies for how to infer the main idea, but not by means of part-whole relationships.

In addition, the research also investigated the effect of language of instruction, i.e., bilingual or monolingual, to teach some of the concepts of part-whole classification to the experimental bilingual group. Bilingual instruction also was used to teach some of the concepts of inference and identification of the main idea to the control bilingual group.

The study was designed to be carried out for a period of twelve class periods. Each period lasted fifty minutes. Before beginning the treatment, the students were given a pretest in identifying the implied main idea, as well as other classification skills. They responded to a similarly constructed posttest after the treatment was completed The instructional period lasted ten school days.

Design

A 2 X 2 design was used in the study. The between-subject factors included the two methods of instruction i.e., classification lessons and lessons implementing usual classroom material; and the language of instruction, i.e., English or Spanish and English. The within-subject variables included the different levels of classification skills: pictures, words, sentences and the implied main idea. The variables discussed in this this report deal with the word classification tasks and the implied main idea tasks.

Four groups of students participated in the study. Two of the groups received classification lessons. One of these groups was taught bilingually. The other two groups of students received standard lessons. One of the latter groups also was taught bilingually. The experimenter taught all four groups participating in the study.

The classification and traditional methods consisted of material that had both abstract and concrete topics. Concrete topics included anything that could be touched, heard or seen. Some of these topics were food, methods of transportation, and animals. Abstract topics included anything that could not be touched, heard or seen. Some of these topics were emotions, historical events, and illness.

The major dependent variable was the students' posttest score on writing the implied main idea of paragraphs. Six paragraphs made up this part of the posttest. Three paragraphs had a concrete topic and three had an abstract topic.

Selection and Identification of The Population

The population with which this study was concerned was limited English-speaking, Spanish-language dominant high school students who were enrolled in a bilingual program. A bilingual program was defined for the purposes of this study as one which provides "instruction in two languages and the use of two languages as mediums for instruction for any part or all of the school curriculum." (Andersson,p. 32). All the participants in the study attended one high school. The school was located in an urban, multicultural school district.

The sixty-three participants in the study came from four bilingual reading classes of approximately 15 students per class. To participate in the study, the students: 1) were native speakers of Spanish; and 2) had a limited knowledge of written English as measured by a standarized reading test, (a score of below 7.0 on The Nelson Reading Test, Level 3, Form C).

The range in age for the population was 15 - 20 years. The mean age was 16.9 years. It should be noted that 22 of the students participating in the study were older than 17. The majority of the students were born in Spanish-speaking countries and most of them came from Mexico. Most of the students reported speaking only Spanish at home. More males than females took part in the study, and almost half of the students were freshmen. The students participating in the study had been in the United States for an average of six years.

Because of the school setting, it was impossible to randomly assign students or classes. The teacher strongly urged that the classes with the most limited English proficient students receive

the bilingual treatments. Among the four groups, in the opinion of the teacher, two groups were reading at a higher level. The teacher wished that each treatment, either experimental or control, have a higher level and a lower level reading group. It was, therefore, within these constraints that the four groups were assigned to a particular treatment group. The classes remained intact due to limitations imposed by the school administration.

The Treatment

The treatment took two weeks to complete. The treatment period lasted ten days and each group therefore, received ten 50-minute periods of instruction. A pretest was administered before the treatment and control lessons. After the completion of the treatment, each group responded to a similarly constructed posttest. The pretest and posttest took fifty minutes to complete. The study took place in January, 1985.

The Classification Lessons

The subject matter of the words and paragraphs dealt both with abstract and concrete topics. In a Piagetian model, students progress from dealing with concrete experiences to abstract experiences. These lessons, by providing both abstract and concrete subject matter, gave the students the opportunity to deal with both types of topics. All the tasks began with clusters of exercises which began with an explicit main idea and ended with an implicit main idea.

The development of the lessons followed the horizontal instructional model of providing the students with concrete,

pictorial and abstract classification experiences. The application of this model to the construction of lessons in how to infer the main idea was based on previous research, Stein (1979), Hadsell (1978) and McInnes (1980). The method used in all the classification lessons was to demonstrate first to the students concepts of part-whole (general-specific) relationships and then have the students learn them. These concepts were taught by providing the students with a variety of classification tasks. The concrete, pictorial, and abstract classification tasks enabled the students to explore the common attributes of groups of objects and pictures, as well as words and sentences. The students had the opportunity to manipulate objects. They were also provided with examples of different types of part-whole relationships and could ask questions about the concepts they were learning. A detailed explanation of the lessons is found in Appendix A.

The Bilingual Lessons

The objective of the bilingual lessons was to enable the students to develop skills in classification, inference, and main idea, while not dealing simultaneously with problems of English vocabulary. The lessons for the two groups, therefore, consisted of some beginning lessons presented bilingually.

The control bilingual group received six lessons and exercises in Spanish and three beginning lessons in English. The pattern for this group was similar to that for the classification treatment group. After the completion of two lessons in Spanish, the control group completed a similar exercise in English during the same instructional period. After the completion of a lesson

in Spanish for both the control and experimental groups, the lesson was discussed in English and the English vocabulary was written on the chalkboard. The Spanish and English presentations took place during the same instructional period. The bilingual aspect gradually was phased out until all the lessons and exercises were presented and completed in English for all four groups.

The Comparison Lessons

The two comparison groups received instruction utilizing readings and exercises from Main Idea and Detail and Inference and Conclusions by John Pescosolido and Reading Tactics A by Olive Niles. The students completed and discussed 10 worksheets from Main Idea and Detail and 12 worksheets from Inferrance and Conclusions The students also completed approximately three chapters in Reading Tactics which dealt with main idea, inference and how to infer the main idea. The worksheets and the textbook exercises were alternated during each class period. These were the materials that the regular classroom teacher uses when teaching inference and main idea. Six lessons were translated and then presented to the bilingual control group. The lessons for the comparison groups were planned with the help and cooperation of the regular classroom instructor.

The Measures

All the students participating in the study were administered a pre- and a posttest that were written by the investigator. These tests were checked for reliability and validity by means of a pilot study of the test instruments. The

administration of each test took approximately fifty minutes.

Pre- and Posttests

The pre- and posttests consisted of four parts. The tests that are described in this paper deal with the word and paragraph tasks.

a) Part One. Word classification Task. (five minutes)

The written part of the pretest began with a word classificaton section. The students were instructed to read two lists of six words each. They were to list the words that seemed to go together. Next, they were instructed to provide a category or subtopic name for each list. Then they were to provide a general topic name for the two groups of words. The two groups of words represented two different tasks, i.e., an abstract and a concrete topic.

b) Part Two. Test in Inferred Main Idea. (twenty minutes)

The students read six paragraphs for which they were asked to write the inferred main idea. Three paragraphs dealt with an abstrct topic and three dealt with a concrete topic.

Student Posttest Measures

After the completion of the study, a posttest was administered to the students. The possttest was constructed exactly the same as the pretest and also consisted of four tasks. The content of the posttest differed from that of the pretest.

IV RESULTS AND DISCUSSION

The results discussed in this section deal with: 1) the comparison of the horizontal instructional model with a traditional method for teaching Spanish-speaking students how to infer the main idea; and 2) the comparison of bilingual instruction and monolingual instruction to teach bilingual adolescents how to infer the main idea. For the purposes of this paper, only the students' posttest scores on the paragraph and word tasks will be discussed.

The analysis will begin with a discussion of the first research question concerning the scores on word classification tasks and scores on implied main idea tasks. The analysis will continue with a discussion of the treatment effect and the language effect on the dependent variables. These variables are the posttest scores on: the implied main idea, and word classification tasks.

Table 1 displays the means, standard deviations, and pre-to-posttest differences for the scores for the concrete paragraph tasks.

Table 1

Means, standard deviations, and pre-to-posttest differences: tests of implied paragraph main idea, concrete topics

	concrete					
N=63 Groups	pretest $\bar{X}$	S	posttest $\bar{X}$	S	difference $\bar{X}$	S
1 n=19	5.78	4.19	7.84	3.62	2.05	4.91
2 n=14	6.85	4.38	7.78	3.78	.93	4.98
3 n=16	7.25	3.04	7.87	2.68	.62	3.38
4 n=14	6.07	3.29	8.64	2.98	2.57	3.15

Groups: 1 = Control Bilingual 3 = Experimental English
2 = Control English 4 = Experimental Bilingual

Note. Maximum Score = 12. Minimum Score = 0.

Table 2

Means, standard deviations, and pre-to-posttest differences: tests of implied paragraph main idea, abstract topics

	abstract					
N=63 Groups	pretest $\bar{X}$	S	posttest $\bar{X}$	S	difference $\bar{X}$	S
1 n=19	4.42	3.62	6.68	3.26	2.26	4.58
2 n=14	6.00	4.55	6.71	3.33	.71	4.89
3 n=16	5.93	2.64	8.25	2.95	2.32	3.03
4 n=14	2.78	3.30	7.07	4.19	4.29	3.69

Groups: 1 = Control Bilingual 3 = Experimental English
2 = Control English 4 = Experimental Bilingual

Note. Maximum Score = 12. Minimum Score = 0.

Tables 1 and 2 show that all four groups of students improved from pretest to posttest on both abstract and concrete topic paragraphs. The Experimental Bilingual and the Experimental English groups had the highest means on the paragraph posttest for both the abstract and concrete topics.

The Experimental English group had the highest mean on the pretest for the concrete topic paragraphs. Although this group showed an improvement on the posttest mean, it was not as much as the experimental Bilingual group.

Tables 1 and 2 also display the pretest to posttest differences for the four groups. The differences were computed by subtracting the pretest paragraph scores from the posttest paragraph scores for each student. All four groups showed an improvement from pretest to posttest. The Experimental Bilingual group had the largest pre-to-posttest difference among the four groups for both the abstract and concrete topic paragraphs. The experimental English group had a slightly larger difference on the abstract paragraphs than the Control Bilingual group, and a substiantially larger difference than the Control English group.

An Analysis of Variance examined the pre-to-posttest differences on the paragraph tests. Tables 3 and 4 display the results of the analysis.

Table 3

Analysis of variance results for concrete paragraph tests

Sources	SS	df	MS	F	sig F
Lang	35.85	1	35.85	1.99	.16
Treat	.23	1	.23	.01	.90
Lang x Treat	2.62	1	2.62	.15	.70
Explained	38.50	3	12.83	.71	.54
Error	1059.05	59	17.95		
Total	1097.55	62			

Table 4

Analysis of Variance results for abstract paragraph tests

Sources	SS	df	MS	f	Sig of F
Lang	47.71	1	47.71	2.80	.099
Treat	51.34	1	51.34	3.01	.088
Lang x Treat	.69	1	.69	.04	.84
Explained	90.02	3	30.00	1.76	.16
Error	1004.83	59	17.03		
Total	1094.87	62			

The analysis results indicate that there was no differences between the groups. On the concrete paragraphs gains, neither main effect for the classification treatment nor language of instruction, nor their interaction were found to be significant. For abstract paragraph gains, however, an effect was more evident for language and treatment. There was no interaction between language and treatment. Therefore, the results did not support the expectation that the group of students that was taught bilingually and received instruction that implemented classification lessons would exhibit significantly higher gains on the posttest than students who received monolingual traditional instruction.

To summarize, there were no significant differences between the groups on their pre-to-posttest gains on the paragraph tasks. There was a suggestion of a treatment and language effect for the abstract paragraph tasks. The gain scores showed that the experimental groups performed better on the posttest than the control groups. There may have been a ceiling effect for the concrete paragraph tasks.

Tables 5 and 6 display the means, standard deviations,

and pre-to-posttest differences for the word classification tasks.

Table 5

Means, standard deviations, and pre-to-posttest differences: word classification tasks, concrete topics

	Concrete					
N=63	pretest		posttest		difference	
Groups	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1 n=19	6.58	2.24	7.11	1.66	.53	2.56
2 n=14	7.36	1.28	7.21	1.05	-.15	1.35
3 n=16	7.44	1.15	8.25	2.80	.81	1.17
4 n=14	6.50	1.91	7.36	2.13	.86	1.51

Groups: 1 = Control Bilingual 3 = Experimental English
2 = Control English 4 = Experimental Bilingual

Note. Maximum Score = 9 Minimum Score = 0.

Table 6

Means, standard deviations, and pre-to-posttest differences: word classification tasks, abstract topics

	Abstract					
N=63	pretest		posttest		difference	
Groups	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1 n=19	5.37	2.89	6.90	1.24	1.53	2.65
2 n=14	7.21	1.62	6.50	1.99	-.71	2.52
3 n=16	7.38	1.62	8.25	1.30	.87	1.87
4 n=14	5.71	2.05	7.57	1.09	1.86	2.24

Groups: 1 = Control Bilingual 3 = Experimental English
2 = Control English 4 = Experimental Bilingual

Note. Maximum Score = 9 Minimum Score = 0.

Table 5 indicates that on the posttest for the classification of concrete topic words, the Experimental English and the Experimental Bilingual group had higher means than the two control groups. On the classification of abstract words

posttest, the Experimental Bilingual and the Experimental English groups had higher mean scores than the control groups. The mean for the control English group declined on the posttest. (Table 6).

An analysis of variance examined the pre-to-posttest differences on the word classification tests in order to test for any differences between the groups. Tables 7 and 8 display the results of the analysis.

Table 7

Analysis of Variance results on gain scores for concrete word classification tasks

Sources	SS	df	MS	F	sig of F
Lang	2.11	1	2.11	.64	.42
Treat	6.18	1	6.18	1.89	.17
Lang x Treat	1.51	1	1.51	.46	.49
Explained	9.11	3	3.03	.93	.43
Error	192.60	59	3.26		
Total	201.71	62			

Table 8

Analysis of Variance results for gain score for abstract word classification tasks

Sources	SS	df	MS	F	Sig F
Lang	43.07	1	43.07	7.75	.007*
Treat	12.74	1	12.74	2.29	.135
Lang x Treat	5.54	1	5.54	.99	.32
Explained	56.85	3	18.95	3.41	.023
Error	32.774	59	5.55		
Total	384.60				

*p<.01

The analysis of variance indicated that for gains on the concrete word classification tasks, neither main effect for treatment nor language, nor their interaction were found to be significant. For abstract word classification tasks, the analysis of variance showed a significant treatment effect for language,

but it did not indicate significance for treatment or the interaction effect of language and treatment. It can be noted that the treatment effect for the abstract word classification task was closer to significance than the effect for the concrete word tasks. The results shown in tables 7 and 8 indicate that students who received classification lessons do not perform significantly better on a posttest in word classification than students who received traditional instruction. However, the analysis indicated that the differences between the groups in language of instruction were significant. The two bilingual treatment groups had the largest differences from pre-to-posttest. An inspection of the gain scores corraborates that the bilingual treatment groups had the largest differences from pre-to-posttest. CONCLUSIONS AND IMPLICATIONS

One of the major questions investigated by the study was the effect of using sequentially developed classification lessons to teach the implied main idea and word classification. The data indicate no statistical support for the hypothesis that classification lessons make a difference in teaching Spanish-language dominant students how to infer the main idea of paragraphs requiring part-whole decisions. However, the pre-to-posttest differences favor a treatment effect, although not statistically significant, for the abstract rather than the concrete tasks.

Although the reasons for the results are unclear, there are some possible explanations. It might be that classification skills are more important in teaching students how to identify

the implied main idea of abstract topic paragraphs than those with implied concrete topics. It is possible that the cognitive strategies involved in identifying the abstract main idea require a more complex schemata or processing model, and that these strategies were more sensitive to the treatment.

The study did not support earlier findings by Valverde and Berget (1983), Hadsell (1979), Stein (1979), and McInnes (1980), that classification lessons made a difference in teaching students how to infer the main idea. One difference between the present study and some of the previous ones was the length of treatment, the number of students and randomization of the sample. For example, in the study conducted by Berget and Valverde, two hundred randomly assigned students participated in the study which was conducted for an entire academic year (9 months). In the present study, it was not possible to randomly assign the students. In addition, it was not possible to randomize the classes and intact classes were used. Hadsell (1979) used sixty-nine randomly assigned students in her study, which lasted for a total of 22 instructional periods. Although Stein (1978) had two groups of students, forty-six total, her study was carried out over a period of 40 instructional periods. McInnes (1980) had a total of twenty-two students in her study. The the groups received the treatment for two fifty-minute instructional periods per week for six weeks. In the present study, the groups received the teatment for five fifty-minute instructional periods per week, for two weeks. Perhaps the treatment is more effective if it is not administered every day for a short period. An instructional period longer than two

weeks would allow more time for the students to internalize the material they are learning.

There were differences between the groups in their ability to classify words, but these differences also were not statistically significant. The treatment effect, although not significant, was most evident among the groups in their ability to classify abstract words. On the abstract word tasks, the mean pre-to-post differences for the experimental bilingual group was 1.86, .87 for the experimental English group, 1.53 for the control bilingual group, and -.71 for the control English group. On the concrete word tasks, the mean pre-to-post differences for the experimental bilingual group was .86, .81 for the experimental English group, .53 for the control bilingual group, and -.15 for the control English group. The treatment effects for the abstract tasks followed a consistent pattern throughout the study, with the exception of the sentence data. The overall treatment effect for the abstract tasks was consistently more evident than the effect for the concrete tasks. This was not anticipated. It is not clear why this occurred, but these are some possibilities. One explanation is that the concrete tasks were simply too easy for the population. It might also be that the cognitive strategies that students use to identify concrete topics are different from those they use to identify abstract topics. Therefore, it may be that the treatment was most effective in helping students develop the strategies necessary to identify abstract rather than concrete topics throughout the study.

Another question with which the study was concerned was the effect of bilingual instruction on inference of the main idea, and the classification of words, sentences and pictures. The study found that bilingual instruction made a statistically significant difference between the groups in their ability to classify abstract words. The two groups that received the bilingual treatments had the larger pre-to-posttest differences. There were no significant language of instruction differences between the groups in their ability to infer the main idea or to classify sentences or pictures. The pre-to-posttest differences favor a language of instruction effect for the abstract paragraph tasks, although the differences were not statistically significant. The data support the hypothesis that bilingual instruction makes a difference in teaching abstract word classification. Support for the hypothesis that bilingual instruction makes a difference is not as strong in teaching students how to classify sentences or to identify the main idea of paragraphs requiring part-whole decisions.

One explanation for this finding may be in the length of the bilingual treatment. The bilingual treatments were only conducted for the first four portions of the treatment period, which consisted of ten instructional segments. In order to more adequately test the hypothesis that bilingual instruction makes a difference, this treatment should be extended for the entire treatment period. As previously noted, the treatment may have been more effective for the abstract tasks, because the strategies involved in dealing with concrete topics may be different from those used when dealing with abstract topics.

Limitations

There are several limitations to the study. The most important of these was the lack of randomization of the students in the investigation of the treatment effects. Another limitation was the small number of students participating in the study. Sixty-three students took part in the study, which meant there were approximately fifteen students per treatment group. Any treatment effects could be more easily measured with a larger group of students in each cell.

The results of the investigation must be cautiously interpreted. Since one cannnot justifiably generalize from this study to teaching practices, or from the target population to any other, the implications must be tentative. Consequently, the principal implications of the research findings concern directions for further research.

Implications for Future Research

As stated in chapter one, very little research has been conducted in teaching reading to Spanish-speaking high school students. In order to verify the results of this study, a similar study should be carried out with a larger, randomly selected population. The results for the word and implied paragraph tasks clearly favor the two experimental groups. In addititon to the significant results for bilingual instruction in the word classification tasks, there was a suggestion of a language of instruction effect in the scores for the paragraph tasks. These results should be further investigated.

Any cultural influences on the students' ability to classify and to generate category labels were not discussed in the study.

It might be that cultural influences affected the students' cognitive strategies in how to classify. Some of these factors include living in a rural or an urban area, or exposure to formal schooling prior to immigrating to the United States. There are many ways to classify and to interpret categories. Cultural factors might have influenced the students' concepts of what constitutes a class. A future study might investigate these factors.

Conclusion

The findings of the investigation are very preliminary. However, very little research, if any, has investigated the role of cognitive strategies in English reading skill development for Spanish-speaking adolescents. The approach used in the investigation was bilingual as well as innovative. The exact manner of implementing reading instruction for Spanish-speaking adolescents is not clear from the present study. The present research explores one approach to implementing such instruction; there may be others.

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APPENDIX A - EXAMPLES OF THE LESSONS

0 Concrete Lessons.

The purpose of these lessons was to introduce to the students the concept of a superordinate class and subordinate classes of objects. The students grouped and classified objects such as colored shapes and various types of leaves. The students grouped like objects and wrote the topic on envelopes. The students completed two concrete tasks.

0 Pictorial Experiences.

The students received envelopes containing pictures which were related by being a sub-group of a large class of items. The students needed to group the pictures that were part of the sub-categories. They were then asked to write the topic of each group of pictures on the appropriate envelope. The students were told that the pictures represented sub-classes and that the "label" is the main topic which is supported by the sub-classes.

Next the students looked at three pictures, listed (orally) the details of the picture, and then gave the topic of the pictures. The instructor pointed out that the students had been following the same procedure as in the concrete and other pictorial lessons. This time, however, the students inferred the topic. They were told that they had made a judgement concerning the topic of the picture, based on the details (sub-classes). There were six picture tasks.

0 Word Classification.

There were four objectives for the word classification lessons. The students learned to 1) classify items under appropriate labels according to common characteristics; 2)

generate accurate labels for the sub-topics they categorized (subordinate classes); 3) generate an overall label for the sub-topics they categorized (superordinate class); and 4) understand the relationship of a main category heading to a sub-category heading by explaining the reasons for the sub-categories and the general category heading for groups of related words. The lessons began by having the students read 3 or 4 lists of words related by topic only, grouping them, and writing a category heading or label for each list. The labels were provided at the top of the page or in the actual lists of words. For example, the three headings given on the worksheet were insects, people, and games. The students read the lists of words and wrote the appropriate words under the corresponding heading. The lessons became progressively more difficult. In the last series of lessons, the students read a list of words that were part of a general category and wrote lists of related words. Next, the students generated the sub-category labels, and then the general or superordinate class label. For example, in this type of exercise, the students read 4 lists of words. There were 3 types of vehicles mentioned in the mixed lists of words: air, land, and water (sub-categories). All the words could be categorized under transportation (general category). The students had to write the groups of related words, generate the sub-categories, and finally the general category. None of the categories were provided.

0 Sentences.

The students next worked with groups of related sentences, in preparation for working with the paragraphs. There were

several types of sentence exercises. In the beginning exercises, for example, the students read 3 - 4 related sentences and then circled the topic sentence. In the last sentence exercises, the students read 4 - 5 related sentences and then wrote the main idea of a group of related sentences. The students followed the same pattern as in the other exercises. They identified a main idea in the same way they identified a main or category heading or label, that is by considering the details as sub-classes and the main idea as the label for a group of sentences. The students completed 5 exercises.

0 Paragraphs.

While introducing the lessons dealing with paragraphs, the instructor reminded the students of previous classification tasks and that the process of the classification tasks and finding the main idea are similar. The students were instructed that there was a relationship between reading and classification tasks they had already completed. This relationship was demonstrated with the following model, which was written on the board by the instructor:

Classifying	Reading
label	main idea
item	detail
item	detail
item	detail
item	detail

The students were instructed that identifying the main idea of a reading passage was similar to locating a label which has been mixed in with a list of items. The relationship between supporting details and the main idea can be thought of as the similar to the relationship between a list of items and its

label.

The last group of paragraph lessons dealt with how to infer the main idea. The students were told that an implied main idea is a main idea which has not been stated. The reader must read and assess each detail of a passage and decide what relationship all the details have. This process was similar to generating a main category label after looking at the sub-category headings and the items listed under each category.

The paragraph lessons began with the students reading paragraphs and circling the explicit main idea which was provided in multiple choice selections. As the lessons progressed, they became more difficult. First, the students were required to read paragraphs, write a list of the details and then write the explicit main idea. In the last part of the lessons, the students listed the details and then wrote the implied main idea. In the last two exercises the students read paragraphs, and then wrote the implied main idea. The students completed 10 exercises. Each worksheet was 2-3 pages long, with approximately three paragraphs per page.